

2.1.1



U.S. DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration  
National Ocean Service  
Office of Response and Restoration  
Coastal Protection and Restoration Division  
c/o EPA Region X (ECL-117)  
1200 Sixth Avenue  
Seattle, Washington 98101

May 20, 2002

Wallace Reid and Tara Karamas  
U.S. EPA Region 10 (ECL-115)  
1200 Sixth Avenue  
Seattle, WA 98101

Chip Humphrey  
U.S. EPA Region 10  
Oregon Operations Office  
811 SW 6<sup>th</sup> Avenue, 3<sup>rd</sup> Floor  
Portland, OR 97503

Dear Wally, Tara, and Chip,

This letter provides NOAA's comments on the Field Sampling Plan, Round 1A, Portland Harbor RI/FS. The document is a draft and is dated April 22, 2002. NOAA appreciates the opportunity to review the document.

NOAA has one general comment. We agree that certain tasks are seasonally dependent and that the LWG should take advantage of the electrofishing permit to collect fish. Therefore, we suggest that EPA approve this workplan. However, this document is not a complete workplan. We do not have an understanding of all the data that will be collected, or of how the LWG intends to use the data. We suggest that EPA approve the collection of this data, but not agree to any of the data interpretation suggested at various points in this workplan. Data interpretation and conclusions about the site should happen only after EPA has approved an RI/FS workplan that spells out how all the data collected for the site will be used. Our more detailed comments follow the structure of the document and are organized by task.

### **Task 1: Mark and Recapture Study of Sub-Yearling Chinook Salmon**

NOAA reviewers are not sure why the LWG is working so aggressively to determine the residence time of juvenile salmon in the lower river. We have several questions and concerns about the proposed approach, including:

1) Why now? Establishing residence time will require an extensive multi-year effort, so getting started early makes sense. Why not start by collecting juvenile fish at the mouth of the Willamette and measuring the concentration of contaminants in their tissue? If contaminant burdens pose a risk, then we can start to figure out where in the system the fish are picking up contaminants.



2) Why residence time? Residence time is an interesting question, but it's not the whole picture. What fish are doing during their time in the lower river is important, too. What are they eating? Are they resting on or near contaminated sediment? The question we really want to answer is what contaminant burden are fish picking up during their time in the lower river. NOAA would prefer a study designed to answer this broader question.

3) Is residence time really a risk driver? We assume that the LWG plans to use residence time to support a risk calculation, such as a hazard quotient, in the future. It would be interesting to run some hypothetical calculations, modifying the residence time over the range indicated by existing data (1 day to 6 months) to determine whether residence time alone would change the outcome of a risk assessment.

4) Will juvenile salmonids drive the risk assessment? Juvenile salmonids are clearly important in this system, and deserve careful consideration in the risk assessment. However, resident fish that spend their entire life cycle in the lower river may be at greater risk because they are present at the site as eggs and as larval fish. Even if juvenile fish are determined to be at risk, the cleanup decision may be driven by what is needed to protect resident species. If this turns out to be the case, will juvenile residence time still be important information?

5) There is a fair amount of information on juvenile salmonid residence time and behavior already, and the City's ongoing study will collect more. Does the LWG need to obtain more data, or can we make reasonable assumptions with the results of existing and planned data collection efforts?

NOAA provided life history information in our comments on last year's proposed work plan to determine juvenile residence time. We think this information is worth repeating, given the stated objective of this study (3.2. "To develop estimates of the residence time for subyearling chinook salmon < 110 mm fork length in the Portland Harbor") and the LWG's contention on the origin of subyearling chinook (3.3. "Originate from two primary spawning groups of chinook salmon.")

Existing data on the lower Willamette River, data from nearby areas, and general life history information on juvenile salmonids indicates that several species and life stages of juvenile anadromous fishes may occur in the area during most months of the year. Information on the Upper Willamette River chinook salmon (outlined in the July 14, 2000, Biological Opinion: Impacts From the Collection, Rearing, and Release of Salmonids Associated with Artificial Propagation Programs in the Upper Willamette Spring Chinook and Winter Steelhead Evolutionarily Significant Units) indicates that juvenile life history includes traits from both ocean- and stream-type development strategies: juveniles emigrate both as young-of-the-year and as age-1 fish.

Mattson (1962) reported three distinct migrations of juvenile spring chinook salmon in the lower Willamette River (Lake Oswego area), including movements of a given year class during late winter through spring (age-0 migrants; 40 - 100 mm), late fall-early winter (age-1

fish, 100-130 mm), and then during the following spring (age 2 fish, 100 - 140 mm). Smolt and fry migration patterns at Leaburg Dam on the McKenzie River show that fry migrations peak during January through April (ODFW, 1990). Based on the small size of juveniles reported at collection facilities at Leaburg Dam on the McKenzie River, it is probable that many of the naturally produced spring chinook in the Willamette subbasins emigrate to lower reaches of tributaries and the main stem Willamette River for completion of rearing before smoltification (ODFW, 1990). This life history characteristic is not uncommon in spring chinook, with subyearling outmigrations out of tributaries and continued freshwater rearing observed in populations in the Deschutes, Grande Ronde, Imnaha, Wenatchee (Howell et al.), and Salmon and Clearwater subbasins (Chapman and Bjornn, 1969; Everest and Chapman, 1972).

Juvenile salmonid collections in 1999 in the vicinity of Ross Island (approximately RM 13) found two distinct size classes of wild chinook salmon, 40-130 mm and 130-210 mm, indicating two age classes. (Beak Consultants, Inc., 2000). The majority of juvenile wild chinook salmon were <100 mm in length. Smaller (<50 mm) age-0 juveniles were found in samples throughout the entire spring sampling period (April 7 through June 7) with large numbers captured in April and early May. On most sampling dates, more wild chinook were collected in beach seines than by electrofishing, and the percentage of wild chinook <100 mm in length was much greater in beach seine collections.

Ward (1992) reported that catches in 1987 indicated that some juvenile salmonids might overwinter in the lower Willamette River. A small number of yearling and subyearling chinook salmon were collected during January and February, approximately 3 months after the most recent hatchery releases.

Seasonal evaluation of fish use of shallow water habitat conducted during 1997 and 1998 in the Columbia River between RM 102 and RM 125 (Willamette River confluence is RM 101.5) found juvenile chinook salmon and steelhead present in the study area during the winter months as well as during the typical spring downstream migration period (Ellis et al. 1999). Very small chinook salmon (35 - 50 mm) were found along the shorelines throughout the study area from mid-December 1977 through February 1998. These fish were assumed to be the offspring of fall chinook salmon spawning in the Columbia River just downstream of Bonneville Dam. Fewer larger juvenile chinook salmon (70 mm - 120 mm) were also found during the winter sampling. Shallow backwater, riprapped shorelines, and industrialized shorelines were found to support higher mean numbers of species during the winter months than the other habitat types sampled and these areas appeared to be preferred overwintering sites for small fish.

North et al. (2002) found multiple age classes of unmarked chinook salmon juveniles present in the lower Willamette River during the winter months (January-March), with the majority of the February and March population represented by subyearling chinook. Subyearling chinook were observed February through June and a clear pattern of growth of age 0+ fish was observed during this time period.

The foregoing information indicates that:

- wild chinook salmon juveniles occur during all months of the year;
- the majority of wild spring chinook salmon in the Spring are <100 mm long;
- small (<50 mm) subyearling chinook salmon occur in the area, as early as January;
- subyearling chinook salmon occur in the area in significant numbers between February and June;
- the subyearling chinook salmon population may include Upper Willamette River spring chinook; and
- the two groups of fall chinook salmon do not represent the entire subyearling population occurring in the lower Willamette River.

6) The proposed study would generate good information on recapture rates and other preliminary data that would help design future studies. It will not provide definitive information, and NOAA will not accept the results of this study alone to characterize behavior or residence time of subyearling chinook salmon in the lower Willamette River. The LWG should consider the utility of the data the study will generate before moving forward with it.

Passage information from the Willamette Falls Sullivan Plant shows that the juvenile fall chinook salmon outmigration occurs between April and June (peak in May). The collection of up to 75% of juveniles for this study is proposed for mid-May at the Sullivan Plant. It is not stated in the proposal but this will likely occur over a few days. Data from these fish may provide travel time information on the population segment of fall chinook sampled but will not provide information that is representative of the overall behavior of subyearling fall chinook migrants. It will not provide residence time information useful to characterize the general behavior of subyearling chinook salmon in the lower Willamette River, which have been shown to reside in the area for an extended period of time, and which may be of different origin (spring chinook), and have different migratory and rearing characteristics.

North et al. (2002), sampling in 2000 and 2001, found subyearling chinook in the area from February through June, after which time few were collected. Highest catch per unit effort was in April and May and they speculated that the low catches from July through September might reflect outmigration or a lower catch due to a response to increasing temperatures in littoral zones. The current study proposal anticipates marking and recapturing fish in mid-May, towards the end of the period in which significant numbers of subyearling chinook are reported in the river. The recovery period (14 to 30 day interval after fish are released) will occur during the time period during which other studies show that fish may be leaving the system, and will not represent an adequate study of residence time.

Section 3.4.5. provides a calculation of the number of fish needed for recapture. There are some questions to be addressed. First, what information was used to make the 30 day maximum estimated residence time of fish in the harbor? Sampling in 1999 near Ross Island found subyearling chinook over a 3 month period. Sampling in 2000 and 2001 (North et al., 2002) found subyearling chinook over a 5 month period. The equation used to calculate a minimum recapture goal is sensitive to the maximum residence time used (i.e. increasing the

maximum residence time from 30 to 45 days changes the minimum recapture goal to 325 fish). Additional information should be provided to justify the 30 day estimate. Second, is it appropriate to use a normal ( $z$ ) distribution when the standard deviation is estimated? Some references suggest the use of the  $t$  distribution rather than  $z$  if the standard deviation is estimated. Confidence intervals are wider when the standard deviation is estimated than when it is known so values of  $t$  are larger than  $z$ . Using a larger value as a standard deviation multiplier for a 90% confidence interval will also affect the calculation, resulting in a higher value for the recapture goal.

The objective of the study is to determine residence time, yet the data evaluation is dependent on extrapolation of rate of downstream movement, with residence times based on individual rates of movement of recaptured fish. There is no way of knowing if a fish recaptured downstream of the release site was actively migrating out of the system or simply moving downstream to more desirable rearing habitat.

A similar study proposed last year using PIT tags indicated that "the study is not intended to generate definitive data but rather to fine-tune field methods and generate information that can be used to design future studies." The PIT tag work, which may have provided information on sampling/recovery efficiency, was not done. Are there any data with which to estimate the expected recovery of marked fish? Are there sampling efficiency data to show that marking 10,000 fish is a sufficient number for the recapture goal? The recapture goal of 141 fish represents a small portion of the fish that are to be marked but given the size of the river, the area to be sampled, and the primary reliance on electrofishing (which appears to be more effective in capturing larger fish, rather than smaller ones), recapture efficiency may not be high enough to collect the target number. How will the data be interpreted if the 141 fish goal is not met? It could mean that a) fish have migrated out of the system (low residence time), b) fish haven't gotten there yet from upstream release points (high residence time), or c) recapture efficiency is low, fish may or may not be there but you don't know.

## **Task 2: Collection of Fish for Chemical Analyses**

Section 4.0, second paragraph. "This collection work will continue into the summer." It appears from this statement and others in this section that the work described in this document will cover all of the tissue collection, not simply the "opportunistic collection" event planned to take advantage of the electroshocking permit. This was not NOAA's understanding of the nature of this "Phase 1A" workplan. We expected to see a workplan that laid out the strategy for tissue collection and compositing before the bulk of the collection effort. This plan lacks important details about the number of samples to be collected, the location of targeted collection sites, the specific species to be collected, the location of reference sites, the acceptable size range for each species, the compositing strategy for each species, and the size of the area over which fish may be composited to represent a "location." These details are important, and EPA should insist that they be spelled out in a written deliverable before most of the fish are collected. If the collection effort will occur before the workplan is approved, then these details should be spelled out in a separate deliverable.

Section 4.4.2, Field Preparation. "A sampling and fish handling protocol will be developed prior to initiation of sampling using EPA guidance." Good. NOAA would like to review this protocol.

Section 4.4.3, bottom of page 17. "If selection of individual species has not occurred before the electroshocking event, the LWG will opportunistically collect representative samples of all species affected by electroshocking." EPA and the LWG should agree on the species lists before this first collection event.

Section 4.5.1. Sample processing. The plan, as described here, is to de-scale the fish, then homogenize each fish separately, whole fish for ecological risk, filets for human health analysis. Then, composite samples will be made up by combining equal masses of tissue from the individual fish. Is this really the plan? Does the LWG plan to homogenize individual juvenile salmon? Whole sturgeon? The compositing strategy (bottom of page 19) is to combine tissue from five to ten fish. Does this include all the species on the human health and ecological risk assessment lists? The plan is simply too general here. This is a good example of why a more detailed written sampling strategy is needed.

Section 4.7. "The data will subsequently be used in the preliminary risk assessment." What preliminary risk assessment? What is a preliminary risk assessment and how would it be used? This is not a deliverable required in the SOW. Until the timing, scope, and purpose of a "preliminary risk assessment" are agreed upon, the LWG should refrain from discussing it. This comment applies to other sections of the document as well.

### **Task 3: Reconnaissance Survey of Hard-Bottom Benthic Communities using Multiplates**

Multiplate sampling is a good way of collecting information about the drift community, and the number and placement of Hester-Dendry samplers looks reasonable. If the multiplate effort is successful, the LWG should consider repeating the effort in the fall.

However, the technique will not provide any information about benthic dwelling organisms. NOAA anticipates that additional benthic sampling will be included in the workplan to address this data gap.

### **Task 4: Reconnaissance Survey of Aquatic Plants and Amphibians**

How extensive an effort is planned? How many days does the LWG anticipate spending on this task? Also, what is meant by "adjacent to the ISA?" What is the planned geographic scope?

### **Task 5: Reconnaissance Survey of Lamprey Species during Annual Harvest**

No comments.

### **Task 6: Monitoring of Deposition and Erosion in Nearshore areas using Sediment Stakes**

NOAA suspects that major storms and other high-flow events may be particularly important in determining sediment transport in shallow and nearshore areas. The LWG should plan to monitor the sediment levels after major events, not just once a month.

### **Task 7: Follow-up Multibeam Acoustic Bathymetry**

No comments at this time.

### **Appendix A: Chemistry QAPP for Total Mercury in Fish Tissues**

Section 5.1, Sample Preservation and Storage. This paragraph could use some clarification. Will the samples be frozen at -20°C before they are homogenized? At what point in the process will the fish for human health be filleted?

### **Appendix B: Laboratory Procedures for Benthic Invertebrate Samples**

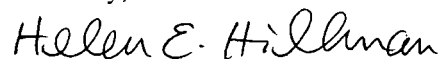
No comments.

### **Appendix C: Health and Safety Plan**

Not reviewed.

Again, NOAA appreciates the opportunity to review the document. If you have any questions about NOAA's comments, please do not hesitate to contact me.

Sincerely,



Helen Hillman  
Coastal Resource Coordinator

cc: Alyce Fritz, NOAA / CPRD (file copy)  
Katherine Pease, NOAA / GCNR  
Nick Iadanza, NOAA / NOS / DAC  
Jeremy Buck, USFWS (email only)  
Kathleen Feehan, Grande Ronde (email only)

Paul Ward, Yakama (email only)  
Brian Cunningham, Warm Springs (email only)  
Audie Huber, Umatilla (email only)  
Barbara Inyan, Nez Perce (email only)  
Patti Howard, CRITFC (email only)  
Tom Downey, Siletz (email only)  
Eric Blischke, Oregon DEQ (email only)  
Rick Kepler, ODFW (email only)

## References

- Beak Consultants, Inc. 2000. Ross Island and Lower Willamette River Fish Monitoring Study - 1999. Final Report prepared for Ross Island Sand & Gravel, Landau Associates, & Perkins Coie, LLP.
- Chapman, D.W. & T.C. Bjornn. 1969. Distribution of Salmonids in Streams, with Special Reference to Food and Feeding. *In*: H.R. MacMillan Lectures in Fisheries: Symposium on Salmon and Trout in Streams, a Symposium Held at the University of British Columbia, February 22-24, 1968.
- Everest, F.H. and E.W. Chapman. 1972. Habitat Selection and Spatial Interaction by Juvenile Chinook Salmon and Steelhead Trout in Two Idaho Streams. *J. Fish. Res. Bd. Canada* 29:91-100.
- Ellis, R.H., & URS Griener/Woodward-Clyde International. 1999. Seasonal Fish Use of Shallow Water Habitats in the Lower Columbia River, West Hayden Island (RM 102) to Sandy River Delta (RM 125). Prepared for U.S. Army Corps of Engineers, Portland, OR.
- Howell, P., Jones, K., Scarnecchia, D., LaVoy, L., Kendra, W., and D. Ortman. 1985. Stock Assessment of Columbia River Anadromous Salmonids; Volume I: Chinook, Coho, Chum, and Sockeye Salmon Stock Summaries. Project No. 83-335. Report prepared under contract to Bonneville Power Administration, Portland, Oregon.
- Mattson, C.R. 1962. Early life history of Willamette River spring chinook salmon. Fish Commission of Oregon, Portland. *In*: NMFS, Biological Opinion: Impacts From the Collection, Rearing, and Release of Salmonids Associated with Artificial Propagation Programs in the Upper Willamette Spring Chinook and Winter Steelhead Evolutionarily Significant Units. July 14, 2000
- NMFS, Biological Opinion: Impacts From the Collection, Rearing, and Release of Salmonids Associated with Artificial Propagation Programs in the Upper Willamette Spring Chinook and Winter Steelhead Evolutionarily Significant Units. July 14, 2000



ODFW. 1990. Willamette River Subbasin Salmon and Steelhead Production Plan. Columbia Basin System Planning Report funded by Northwest Power Planning Council and the Columbia Basin Fish and Wildlife Authority. Portland, Oregon.

Ward, D.L. 1992. Effects of Waterway Development on Anadromous and Resident Fish in Portland Harbor. Final Report of Research funded by Port of Portland, Portland, Oregon.